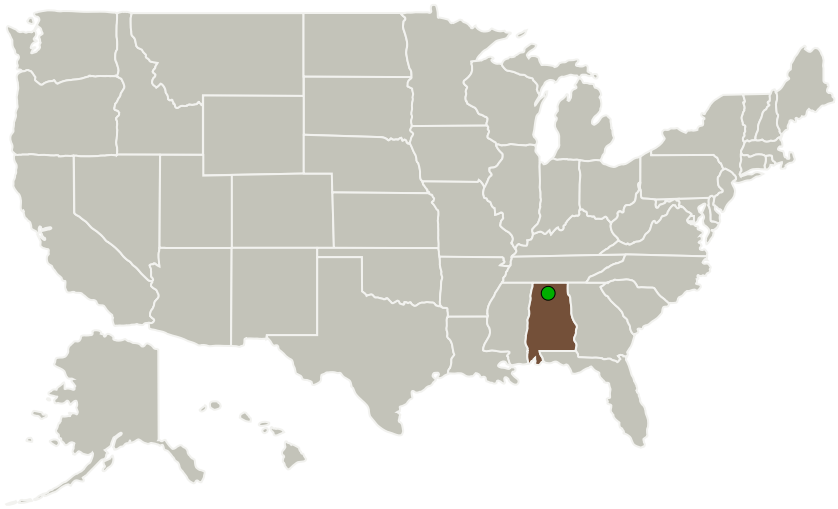
# Green Monopropellant Propulsion for Small Spacecrafts, Phase I

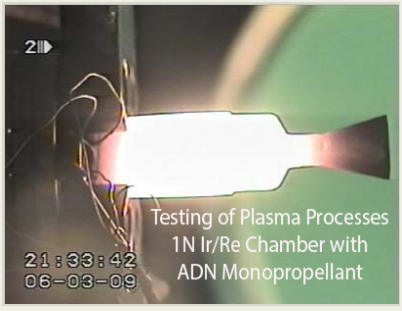
Completed Technology Project (2016 - 2016)

## Project Introduction

One of the biggest obstacles preventing the widespread implementation of small satellites is the process of actually getting them into space. Current methods include hitching rides as secondary payloads. Although this initiative has provided significant new launch capacity for CubeSat-class spacecraft, it is not without issues, most specifically limited orbits and orbital lifetime. Many missions need higher orbits to perform their missions; and lower orbits are subject to atmospheric drag that may cause premature reentry. Safe and affordable miniaturized propulsion can overcome these limiting factors and is a high-visibility capability sought by the CubeSat community. Even basic capabilities to push in one direction will allow nanosats to remain in orbit longer, or allow a satellite placed into low-Earth orbit to nudge itself to a higher geostationary orbit. In support of this technological need, Plasma Processes will design, fabricate and demonstrate combustion of a miniaturized propulsion system compatible with non-toxic HAN- and ADN-based green monopropellants for small spacecraft propulsion. The use of advanced, non-toxic propellants can increase mission capabilities including longer mission durations, additional maneuverability, increased scientific payload space, and simplified launch processing. Adding propulsion will also enable de-orbiting of the satellite after completion of the mission.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

**Small Business Innovation Research/Small Business Tech Transfer**

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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| Marshall Space Flight Center(MSFC) | Supporting Organization | NASA Center | Huntsville, Alabama |

| Primary U.S. Work Locations |
|---|
| Alabama |

## Project Transitions

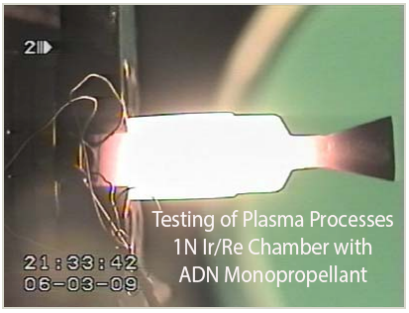
**June 2016:** Project Start

**December 2016:** Closed out

**Closeout Documentation:**

- Final Summary Chart*(https://techport.nasa.gov/file/139679)*

## Images




**Briefing Chart Image**
Green Monopropellant Propulsion for Small Spacecrafts, Phase I *(https://techport.nasa.gov/image/133458)*

**Final Summary Chart Image**
Green Monopropellant Propulsion for Small Spacecrafts, Phase I Project Image *(https://techport.nasa.gov/image/129199)*

## Project Management

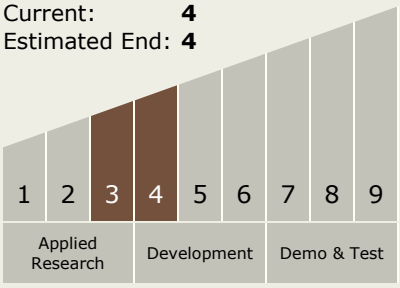
**Program Director:**
Jason L Kessler

**Program Manager:**
Carlos Torrez

**Principal Investigator:**
Anatoliy Shchetkovskiy

## Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**




## Technology Areas

**Primary:**

- TX01 Propulsion Systems
  - TX01.1 Chemical Space Propulsion
    - TX01.1.2 Earth Storable

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System